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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/675,427	09/29/2000	Sharad Saxena	D5116-00002	3862

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IP DEPARTMENT  
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PHILADELPHIA, PA 19103-7396

EXAMINER

ROSALES HANNER, MORELLA I

ART UNIT	PAPER NUMBER
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2128

DATE MAILED: 04/22/2004

8

Please find below and/or attached an Office communication concerning this application or proceeding.

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## Office Action Summary

Application No.

09/675,427

Applicant(s)

SAXENA ET AL.

Examiner

Morella I Rosales-Hanner

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 September 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☐ Claim(s) \_\_\_\_\_ is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 - 10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 5.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

1. Claims 1 – 10 are pending and have been examined.

***Priority***

2. The office denies Applicants priority claim under 35 U.S.C 119(e) to U.S. provisional applications **60,166,242** filed on **November 18<sup>th</sup>, 1999** for the following reasons:

- provisional application contains missing/incomplete disclosure. For example, the version number of the "pdPca User's Manual" is specified as a '?' [Pg 11, ref 13], recitation of 'XXX' for the number of variables required with the disclosed technique [last paragraph of section VII], recitation of "...Figure/Table from Phil. Something about SPACE complexity of correlation matrix rep." [last 3 lines of section V] ;
- provisional application improper attempt to incorporate two references [Pg 6] as well as sixteen references [Pg 11]; and
- numerous inconsistency between the provisional application and the instant application.

***Information Disclosure Statement***

3. The reason for incorporation by reference practice with respect to applications, which are to issue as U.S. patents, is to provide the public with a patent disclosure that minimizes the public's burden to search for and obtain copies of documents

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incorporated by reference that may not be readily available. Therefore, the Applicant is requested to furnish the Office with a copy of the essential reference cited on page 6 of the provisional application as well as the sixteen essential references cited on page 11 of the provisional application.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4.1 Claims 2, 3, 7, and 8 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by written publication Zanella et al. These claims are drawn to a method of modeling and simulating the impact of local mismatch on performance of integrated circuits comprising the steps of:

- a) estimating a representation of component mismatch in a form suitable for circuit simulation from device performance measurements (see sections 2-3);
- b) performing principal component or principal factor decomposition for local mismatch, including screening (see sections 2-3);
- c) performing statistical simulation with local mismatch obtained in step b; and
- d) obtaining eigen vector/values (see sections 2-3)

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5.1 **Independent claims 1 and 6 and dependent claims 4-5, 9-10** are rejected under 35 U.S.C. 103(a) as being unpatentable over **U.S. Patent No. 6,356,861** issued to Singhal et al. hereafter referred to as *Singhal*, in view of a printed publication by Zanella et al. titled "**Analysis of the Impact of Intra-die Variance on Clock Skew**" hereafter referred to as *Zanella*, in further view of a printed publication by C. Guardiani (co-inventor) et al. titled "**Design for Manufacturability: A two-Step Analytic Modeling Approach**" hereafter referred to as *Guardiani*. Claims 1, 6 and dependent claims 4-5, 9-10 are drawn to a method for statistical modeling and simulation of the impact of global variation and local mismatch on the performance of integrated circuits, comprising the steps of:

- a) estimating a representation of component mismatch from device performance measurements in a form suitable for circuit simulation;
- b) performing a first level principal component or principal factor decomposition of global variation, including screening;
- c) performing a second level principal component decomposition including screening for each factor retained in step b to represent local mismatch;

- d) performing statistical simulation with the joint representation of global variation and local mismatch obtained in step c; and
- e) obtaining eigen vector/values.

*Singhal* discloses:

- a) developing a statistical model from a set of worst-case files [Col 4, lines 53 – 67];
- b) performing first level principal component analysis (PCA) of inter-die (global) variations including screening [Col 6, lines 13 – 32];
- c) performing statistical model evaluation with the result obtained in step b.

*Singhal* does not disclose performing a second level principal component decomposition to represent local mismatch or obtaining eigen vector/values from the combination of global and local principal component analysis.

*Zanella* teaches [Section II] mismatch simulation using proper statistical techniques PCA and local variations and obtaining a covariance matrix (inherently eigen value/vector) in order to account for process variability.

*Guardiani* teaches [Section 4] a method of reducing the total number of circuit simulations by using a two-step local or global analytic characterization of a circuit performance including yield.

It would have been obvious to one of ordinary skills in the art, at the time of the invention to modified the statistical method disclosed by *Singhal* to perform a second principal component decomposition using local variations as taught by *Zanella* in order to reduce the total number of circuit simulations involve in yield optimization

### **Response Guidelines**

6. A shortened statutory period for reply to this office action is set to expire **3 (three) months and 0 (zero) days** from the mailing date of this action. In the event a first reply is filed within **2 (two) months** of the mailing date of this action and the advisory action is not mailed until after the end of the **3 (three) months** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this action.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Morella Rosales-Hanner whose telephone number is (703) 305-8883. The examiner can normally be reached Monday-Friday from 7:00 a.m. to 3:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Teska can be reached on 703 305-9704. The fax number for the organization where this application or proceeding is assigned is (703) 872-9306.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

MRH

April 14, 2004

*CEM*  
*W. T. ...*  
*A. U. 2123*  
*Primary Examiner*